



UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
Address: COMMISSIONER FOR PATENTS
P.O. Box 1450
Alexandria, Virginia 22313-1450
www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/697,511	10/30/2003	Gurtej S. Sandhu	MIO 0092 VA/40509.271	7666

7590 04/19/2005

DINSMORE & SHOHL LLP
Suite 500
One Dayton Centre
Dayton, OH 45402-2023

EXAMINER

LUND, JEFFRIE ROBERT

ART UNIT	PAPER NUMBER
----------	--------------

1763

DATE MAILED: 04/19/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

10/697,511

Applicant(s)

SANDHU, GURTEJ S.

Examiner

Jeffrie R. Lund

Art Unit

1763

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 30 October 2003.
- 2a) ☐ This action is FINAL. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-19 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-19 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 30 October 2003 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☒ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date 1/20/05.
- 4) ☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____.
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: _____.

DETAILED ACTION

Claim Objections

1. Claims 18 and 19 are objected to because of the following informalities: in claim 18 line 3 the phrase "to provide a flow on an input gas" should read --to provide a flow of an input gas--. Appropriate correction is required.

Claim Rejections - 35 USC § 103

2. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

3. Claims 1-19 are rejected under 35 U.S.C. 103(a) as being unpatentable over Sandhu et al, US Patent Application Publication 2003/0102008 A1 in view of Miller et al, US Patent 6,200,389 B1.

The applied reference has a common inventor with the instant application. Based upon the earlier effective U.S. filing date of the reference, it constitutes prior art only under 35 U.S.C. 102(e). This rejection under 35 U.S.C. 103(a) might be overcome by: (1) a showing under 37 CFR 1.132 that any invention disclosed but not claimed in the reference was derived from the inventor of this application and is thus not an invention "by another"; (2) a showing of a date of invention for the claimed subject matter of the application which corresponds to subject matter disclosed but not claimed in the reference, prior to the effective U.S. filing date of the reference under 37 CFR 1.131; or (3) an oath or declaration under 37 CFR 1.130 stating that the application and

Art Unit: 1763

reference are currently owned by the same party and that the inventor named in the application is the prior inventor under 35 U.S.C. 104, together with a terminal disclaimer in accordance with 37 CFR 1.321(c). This rejection might also be overcome by showing that the reference is disqualified under 35 U.S.C. 103(c) as prior art in a rejection under 35 U.S.C. 103(a). See MPEP § 706.02(I)(1) and § 706.02(I)(2).

Sandhu et al teaches an apparatus for chemically treating a surface of a workpiece that includes: a input gas supply 20b; a dispenser unit including a nozzle 32 for supplying the input gas in a laminar flow over a workpiece 17; a transmission gas supply 30 providing a flow of substantially nonattenuating gas; a UV laser source 46 with optics 44 to form a wide scanning beam 8 and converging the beam 8 of UV radiation through window 60 and into the flow of the input gas to dissociate the input gas into a high flux of reactive gas species 6 that reacts with the surface of the workpiece to chemically treat the workpiece; a transition stage 38 that includes a pressure sensor, gas sensor, and heating and cooling means that moves the workpiece under the dispenser unit and beam; a vacuum pump 34 for exhausting the processing chamber 16; a mixing chamber 28; a controller 42; a monitor 68 for monitoring the completion of the treatment; and a beam dump 62. The finite distance is less than a few mean-free-path lengths of the generated reactive gas species. The dispenser unit and beam can be one of a plurality of dispenser units and beams. (Entire document)

Sandhu et al differs from the present invention in that Sandhu et al does not teach a second gas port for injecting a precursor gas onto the surface of the workpiece;

Art Unit: 1763

a third gas port for purge gas; evacuation ports on either side of the purge gas port to evacuate the purge gas; and a second vacuum pump attached to the evacuation ports.

Miller et al teaches a gas dispenser unit 160 containing precursor injecting ports 105 separated by inert gas purge ports 106 for supplying purge gases to separate the precursor ports 105, and evacuation ports 107 connected to a vacuum pump via line 159 for evacuating the purge gas. (Figure 19)

The motivation for adding a second port and purge curtain to the dispenser unit of Sandhu et al is to enable the apparatus of Sandhu et al to supply different gases to perform different processes simultaneously in the same processing chamber and to keep these process separate from each other as taught by Miller et al.

Therefore it would have been obvious to one of ordinary skill in the art at the time the invention was made to add a precursor port with a purge curtain to the apparatus of Sandhu et al as taught by Miller et al.

4. Claims 1, and 3-18 are rejected under 35 U.S.C. 103(a) as being unpatentable over Elliott et al, US Patent 5,669,979 in view of Miller et al, US Patent 6,200,389 B1.

Elliott et al teaches an apparatus for chemically treating a surface of a workpiece that includes: a input gas supply; a dispenser unit including a nozzle 434 for supplying the input gas in a laminar flow over a workpiece 414; a UV laser source 420 with optics 428 to form a wide scanning beam 416 and converging the beam of UV radiation through window 430 and into the flow of the input gas to dissociate the input gas into a high flux of reactive gas species 418 that reacts with the surface of the workpiece to chemically treat the workpiece; a transition stage 440 that moves the workpiece under

Art Unit: 1763

the dispenser unit and beam; a vacuum pump 444 for exhausting the processing chamber 472; a mixing chamber 524; a controller 442; a monitor 520 for monitoring the completion of the treatment; and a beam dump 462. The finite distance is less than a few mean-free-path lengths of the generated reactive gas species. The dispenser unit and beam can be one of a plurality of dispenser units and beams. (Entire document, specifically, figures 11, 15 and 16)

Elliott et al differs from the present invention in that Elliott et al does not teach a second gas port for injecting a precursor gas onto the surface of the workpiece; a third gas port for purge gas; evacuation ports on either side of the purge gas port to evacuate the purge gas; a second vacuum pump attached to the evacuation ports; a workpiece heating/cooling means; and a pressure and gas sensors.

Miller et al teaches a gas dispenser unit 160 containing precursor injecting ports 105 separated by inert gas purge ports 106 for supplying purge gases to separate the precursor ports 105; evacuation ports 107 connected to a vacuum pump via line 159 for evacuating the purge gas; and a chuck 120 and transition stage 216 that includes heating and cooling means and sensors. (Figure 19)

The motivation for adding a second port and purge curtain to the dispenser unit of Elliott et al is to enable the apparatus of Elliott et al to supply different gases to perform different processes simultaneously in the same processing chamber and to keep these process separate from each other as taught by Miller et al. The motivation for adding the heating/cooling means to the transition stage of Elliott et al is to provide a means to control the temperature of the workpiece, chuck, and transition stage by

Art Unit: 1763

heating and cooling the workpiece, chuck, and transition stage as taught by Miller et al. The motivation for adding sensors to the transition stage of Elliott et al is to provide feed back to the controller to enable the accurate control of the processing conditions such as the pressure and gas concentrations etc.

Therefore it would have been obvious to one of ordinary skill in the art at the time the invention was made to add a precursor port with a purge curtain, heating and cooling means, and sensors to the apparatus of Elliott et al as taught by Miller et al.

5. Claims 2 and 19 are rejected under 35 U.S.C. 103(a) as being unpatentable over Elliott et al, US Patent 5,669,979, and Miller et al, US Patent 6,200,389 B1 as applied to claims 1, and 3-18 above, and further in view of Nakayama et al, US Patent 4,924,807.

Elliott et al and Miller et al differ from the present invention in that they do not teach a fourth gas port adapted to provide a transmission gas to the reaction chamber.

Nakayama et al teaches supplying a transmission gas Q through a port. (Entire document, specifically, figures 5-8)

The motivation for supplying a transmission gas through a port to the apparatus of Elliott et al and Miller et al is to control the flow of the input gas and to concentrate the input gas near the workpiece and to prevent contamination of inside of the window caused by the deposition of reaction products on the inside of the widow as taught by Nakayama et al.

Therefore it would have been obvious to one of ordinary skill in the art at the time the invention was made to supply a transmission gas to the apparatus of Elliott et al and Miller et al as taught by Nakayama et al.

Art Unit: 1763

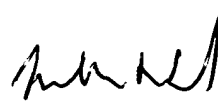
Conclusion

6. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure. The cited art teaches the technological background of the invention.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Jeffrie R. Lund whose telephone number is (571) 272-1437. The examiner can normally be reached on Monday-Thursday (6:30 am-6:00pm).

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Parviz Hassanzadeh can be reached on (571) 272-1435. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).


Jeffrie R. Lund
Primary Examiner
Art Unit 1763

JRL
4/14/05